

**From:** [Khoury, Ghassan](#)  
**To:** [Tzhone, Stephen](#); [Rauscher, Jon](#)  
**Cc:** [Sanchez, Carlos](#); [Meyer, John](#); [Villarreal, Chris](#)  
**Subject:** RE: Arkwood summary for HQ; conclusion/positions concurrence requested  
**Date:** Friday, September 18, 2015 11:23:36 AM  
**Attachments:** [R6 position on PTW for Arkwood Final Draft.docx](#)

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Stephen, we discussed this before. See attached file. The HI associated with 16,750 ppt will be about 23.

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**From:** Tzhone, Stephen  
**Sent:** Thursday, September 17, 2015 6:03 PM  
**To:** Khoury, Ghassan; Rauscher, Jon  
**Cc:** Sanchez, Carlos; Meyer, John; Villarreal, Chris  
**Subject:** FW: Arkwood summary for HQ; conclusion/positions concurrence requested

What is the calculation of HI of the dioxin at 16,750 ppt (see Robin's question below)?

Thus far, Deana as the soil sampling SME has concurred on our soil comments and Marlene as the national dioxin coordinator is agreeable to our summarized rationale as well... but is deferring to Robin as the national principal threat waste coordinator. From Robin's email, my sense is that she is close to reaching a decision but needs this information for a meeting with Jim Woolford.

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**From:** Tzhone, Stephen  
**Sent:** Thursday, September 17, 2015 5:53 PM  
**To:** Anderson, RobinM  
**Cc:** Berg, Marlene; Scozzafava, MichaelE; Ammon, Doug  
**Subject:** RE: Arkwood summary for HQ; conclusion/positions concurrence requested

I'll will check with the R6 risk assessors and get an answer.

Also, regarding this statement (see highlight), we agree that 10-3 alone is not the only consideration in a PTW discussion and that's why four main lines of evidence were provided for HQ's consideration.

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**From:** Anderson, RobinM  
**Sent:** Thursday, September 17, 2015 3:12 PM  
**To:** Tzhone, Stephen  
**Cc:** Berg, Marlene; Scozzafava, MichaelE; Ammon, Doug  
**Subject:** FW: Arkwood summary for HQ; conclusion/positions concurrence requested

What is the HI of the Dioxin at 16,760 ppt. it was the HI issue that we needed to put in front of Jim Woolford.

A 10-3 alone is not the only consideration in a PTW discussion.

The only thing that comes into play is the distribution - if it is not findable - scattered then it might



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not be a PTW. IF it is high volume, we might say that it is too large a volume – but then again, if some part is significantly higher then that areas might be PTW.

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**From:** Berg, Marlene  
**Sent:** Thursday, September 17, 2015 4:07 PM  
**To:** Anderson, RobinM  
**Subject:** RE: Arkwood summary for HQ; conclusion/positions concurrence requested

Robin, Deana is handling the sampling issue.  
Marlene

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**From:** Anderson, RobinM  
**Sent:** Thursday, September 17, 2015 2:38 PM  
**To:** Berg, Marlene; Tzhone, Stephen; Poore, Christine; Bartenfelder, David; Huling, Scott  
**Cc:** Sanchez, Carlos; Meyer, John  
**Subject:** RE: Arkwood summary for HQ; conclusion/positions concurrence requested

What is the sampling issue?

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**From:** Berg, Marlene  
**Sent:** Wednesday, September 16, 2015 11:55 AM  
**To:** Tzhone, Stephen; Poore, Christine; Anderson, RobinM; Bartenfelder, David; Huling, Scott  
**Cc:** Sanchez, Carlos; Meyer, John  
**Subject:** RE: Arkwood summary for HQ; conclusion/positions concurrence requested

Steve,  
I will defer to Deana re sampling and Dave re ground water.  
I only had one comment on item #5:

It is recommended that these areas be considered for receptor exposures that are specific to these locations, including a maintenance worker and adolescent/adult trespasser.

Are there other current/future land uses beyond the site boundary in addition to maintenance worker and adolescent/adult trespasser?

Marlene

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**From:** Tzhone, Stephen  
**Sent:** Tuesday, September 15, 2015 1:37 PM  
**To:** Poore, Christine; Berg, Marlene; Anderson, RobinM; Bartenfelder, David; Huling, Scott  
**Cc:** Sanchez, Carlos; Meyer, John  
**Subject:** RE: Arkwood summary for HQ; conclusion/positions concurrence requested

Hi Christine, Marlene, Robin,

I just wanted to update that R6 will be moving forward with these gw and soil comments, unless

we're advised otherwise by Sep 30.

The gw path forward will follow the strategy outlined in the attached 'draft\_Arkwood GW Path Forward Sep 2015.docx'. The gw comments to be sent to the PRPs are in the attached 'gw\_EPA draft final comments.docx'.

The soil path forward will follow the strategy outlined in the previous June 12 email below. The soil comments to be sent to the PRPs are in the attached 'soil\_EPA draft final comments.docx'.

Please let me know if any comments, thanks.

Thanks,

Stephen L. Tzhone  
Superfund Remedial Project Manager  
214.665.8409  
[tzhone.stephen@epa.gov](mailto:tzhone.stephen@epa.gov)

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**From:** Tzhone, Stephen  
**Sent:** Friday, June 12, 2015 9:54 AM  
**To:** Poore, Christine; Berg, Marlene; Anderson, RobinM  
**Cc:** Sanchez, Carlos; Meyer, John  
**Subject:** Arkwood summary for HQ; conclusion/positions concurrence requested

Hi Christine, Marlene, Robin,

I've been asked to summarize the R6 position on Arkwood and to obtain your concurrence as OSRTI representatives. Currently, we are in a dioxin re-evaluation for this former 18-acre wood treater. The 1990 ROD implemented an industrial soil remediation goal for dioxin at 20,000 ppt TEQs, via excavation, incineration, and 6" cover.

As part of the dioxin re-evaluation, we wanted to answer this main question:

Main Question: Are the remaining site soils with dioxin principal threat wastes?

Current R6 conclusion: No, the remaining site soils with dioxin are not principal threat waste.  
Rationale: The 1991 principal threat waste guidance defines PTWs as "those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained or would present a significant risk to human health or the environment should exposure occur". Thus, our conclusion was based on:

- 1) Are the remaining soils with dioxin (up to 16,750 ppt TEQs max underneath the cover) highly toxic?

Current R6 position: No, remaining soils with dioxin up to 16,750 ppt TEQs max are not highly toxic. Rationale: The 1991 PTW guidance calls for using 10<sup>-3</sup> as a treatment marker. Using the current Tier 3 RSL value (based on Cal EPA) of 22 ppt TEQs = 10<sup>-6</sup>, we equated that to 22,000 ppt TEQs = 10<sup>-3</sup>. Since the remaining site soil levels with dioxin are under 10<sup>-3</sup>, it would not be PTW based on the 10<sup>-3</sup> marker. We do note that although the 1991 guidance did not mention the use of hazard quotients or recommend treatment markers based on hazard quotients, consideration on the subject would be helpful in a future update to the guidance due to the existence of the Tier 1 value for non-cancer and that current national dioxin PRGs are based on non-cancer.

2) Are the remaining soils with dioxin highly mobile?

Current R6 position: No, the remaining soils with dioxin at the site are not highly mobile. Rationale: Dioxin readily binds to soil and has very low water solubility. At the site, the remaining soils with dioxin up to 16,750 ppt TEQs max are underneath the 6" cover, as required by the 1990 ROD remedy. As an extra precaution, we are checking for dioxin colloidal transport in gw.

3) Can remaining soils with dioxin be reliably contained?

Current R6 position: Yes, remaining soils with dioxin can be reliably contained. Rationale: We utilized incremental sampling and sampled the cover, along with other areas that are uncovered. For the cover, the validated PRP incremental sample (for all sampling units) is 610 ppt TEQs max. The EPA co-located lab replicate (done on two of the sampling units) is 288 ppt TEQs and 333 ppt TEQs. Thus, sampling evidence shows that the integrity of the cover has not been compromised since the original remedy was implemented over two decades ago.

4) Would the remaining soils with dioxin present a significant risk to human health or the environment should exposure occur?

Current R6 position: Since the completion of the 1990 ROD remedy, industrial worker exposure has not occurred and is not occurring. Thus, we have answers for two exposure scenarios:

For the actual past, current, and likely future maintenance worker exposure: No, the remaining soils with dioxin would not present a significant risk should exposure occur. Rationale: The maintenance worker exposure is set at 12,100 ppt TEQs. If remedy components were intact, there would be no exposure. If remedy components were not intact, the maintenance worker can potentially be exposed to remaining soils with dioxin up to 16,750 ppt TEQs max underneath the cover. The risk difference between 12,100 ppt TEQs and 16,750 ppt TEQs is not significant (if significance is defined by being more than an order of magnitude).

For a theoretical future industrial worker exposure: Yes, the remaining soils with dioxin could

present a significant risk if exposure occurs. Rationale: The industrial worker exposure is set at 730 ppt TEQs. If remedy components were intact, there would be no exposure. If remedy components were not intact, the industrial worker can potentially be exposed to the remaining soils with dioxin up to 16,750 ppt TEQs max underneath the cover. The risk difference between 730 ppt TEQs and 16,750 ppt TEQs could be considered significant (if significance is defined by being more than an order of magnitude); however, sample results show that all remedy components remain in place and intact, including ICs to ensure exposure is controlled.

Please respond with any comments and your concurrence status on our conclusion/positions. Attached fyi for reference: draft regulator soil and gw comments, CSM figures, and PRP sampling reports.

Thanks,

Stephen L. Tzhone  
Superfund Remedial Project Manager  
214.665.8409  
[tzhone.stephen@epa.gov](mailto:tzhone.stephen@epa.gov)

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Site Team:

Stephen Tzhone: R6 RPM  
Jon Rauscher: R6 site risk assessor  
Ghassan Khoury: R6 dioxin coordinator  
Deana Crumbling: HQ soil sampling support  
Scott Huling: HQ gw support  
Kent Becher: USGS gw support  
EA Engineering: field contractor support

Mgmt:

Chris Villarreal: R6 risk assessment section  
Carlos Sanchez: R6 AR/TX remedial section  
John Meyer: R6 remedial branch

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